

REMARKS

The final Office Action of March 28, 2006, has been received and reviewed.

Claims 1-17 are currently pending and under consideration in the above-referenced application, each standing rejected.

Reconsideration of the above-referenced application is respectfully requested.

Rejections under 35 U.S.C. § 103(a)

Claims 1-17 have been rejected under 35 U.S.C. § 103(a).

The standard for establishing and maintaining a rejection under 35 U.S.C. § 103(a) is set forth in M.P.E.P. § 706.02(j), which provides:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure.
In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Batchelder

Claims 1-4, 6, 9, and 11-17 stand rejected under 35 U.S.C. § 103(a) for reciting subject matter which is allegedly unpatentable over the subject matter taught in U.S. Patent 6,019,165 to Batchelder (hereinafter "Batchelder").

Batchelder teaches a heat exchange apparatus with a heat source (*e.g.*, a semiconductor device), a thermal conductor and electrical insulator 14 that conducts heat from the heat source, and an active spreader plate 20 that receives heat from the thermal conductor and electrical insulator 14. Col. 4, lines 63-67; FIG. 2. Heat is transferred into the active spreader plate 20 and optionally conducted into a fin array 52 that further transfers the heat to a heat transfer fluid sealed in flow channels 50 located inside the active spreader plate 20. Col. 5, lines 1-7; FIG. 2. An impeller 54, which rotates under influence of a magnet 56, causes the heat transfer fluid to

move through the flow channels 50. Col. 5, lines 21-26; FIG. 2; *see also* FIGS. 3-5, 7-8. When the heated fluid moves through the flow channels 50, heat is transferred to and dispersed by the active spreader plate 20. *Id.*

Independent claim 1, as proposed to be amended herein, recites, “[a] heat sink for assembly with a semiconductor device component comprising: a heat transfer element comprising a unitized structure...” A well known definition of the term “unitized” is to make or transform into a single unit, The American Heritage Dictionary of the English Language (4th Ed., 2000).

It is respectfully submitted that there are several reasons that the teachings of Batchelder do not support a *prima facie* case of obviousness against any of claims 1-4, 6, 9, or 11-17.

First, it is respectfully submitted that Batchelder does not teach or suggest each and every element of independent claim 1 or of any of claims 2-17 depending therefrom. This is because the heat transfer element of Batchelder includes a large number of assembled elements. As an example, the active spreader sheet 20 alone includes a compliant insulation sheet 14, a bottom sheet 202, a fin means 52, heat transfer fluid, a medial sheet 206, an upper stamped plate 208, a channel forming sheet 210, a top sheet 212, an impeller 54, and an axle 214. Col. 7, lines 24-50, FIG. 7. Batchelder requires that two or more pieces be used to form just the flow-channel 50-containing portion of the active spreader plate 20. Col. 4, lines 9-19. Moreover, some of these elements (*e.g.*, the heat transfer fluid, the impeller 54, the axle 214) move. Therefore, it would be apparent to one of ordinary skill in the art that Batchelder does not teach or suggest a “heat transfer element comprising a unitized structure,” as would be required for Batchelder to support a *prima facie* case of obviousness against independent claim 1 under 35 U.S.C. § 103(a).

Each of claims 2-4, 6, 9, and 11-17 is allowable, among other reasons, for depending directly or indirectly from independent claim 1, which is allowable.

Claim 2 is further allowable since Batchelder neither teaches nor suggests that at least a portion of a heat transfer element that has been fabricated as a unitary structure may include a plurality of adjacent, mutually adhered regions.

Claim 6 is additionally allowable because Batchelder includes no teaching or suggestion of a heat transfer element that is fabricated as a unitary structure including particles that are secured to one another.

Claim 16, which depends from claim 2, is also allowable since Batchelder does not teach or suggest that at least a portion of a heat transfer element that has been fabricated as a unitary structure may include a plurality of superimposed, contiguous, mutually adhered layers.

Claim 9, which depends from claim 16, is further allowable because Batchelder lacks any teaching or suggestion of at least a portion of a heat transfer element that has been fabricated as a unitary structure from a plurality of sheets of thermally conductive material.

Claim 11, which depends from claim 9, is also allowable since Batchelder neither teaches nor suggests that at least a portion of a heat transfer element that has been fabricated as a unitary structure may include a plurality of sheets that are thermally bonded together.

Claim 12 is additionally allowable because Batchelder does not teach or suggest a heat transfer element with a nonlinear passageway that is configured to permit airflow therethrough. Instead, the teachings of Batchelder are limited to sealing a “heat transfer fluid” within flow channels 50. Further, the fan housing 30 that has been referred to by the Examiner, which does not include or form a nonlinear path through a heat transfer element, is separate and remote from the flow channels 50. *See FIGS. 1 and 2; col. 9, lines 22-48.*

Claim 14 is additionally allowable since Batchelder lacks any express or inherent description of a heat dissipation element (*e.g.*, fins 28) that includes a plurality of adjacent, mutually adhered regions comprising thermally conductive material. *See col. 7, lines 4-22.*

Claim 17, which depends from claim 14, is further allowable because Batchelder neither expressly nor inherently describes a heat dissipation element that includes a plurality of superimposed, contiguous, mutually adhered layers. *See col. 7, lines 4-22.*

Second, it is respectfully submitted that, without the benefit of hindsight that the claims of the above-referenced application have provided to the Office, one of ordinary skill in the art wouldn’t have been motivated to modify the teachings of Batchelder in the asserted manner. Specifically, one of ordinary skill in the art wouldn’t have been motivated by Batchelder to

develop a heat transfer element that is fabricated as a unitized structure. In view of the number of parts of the active spreader sheet 20 of Batchelder, as well as the requirement that the active spreader sheet 20 include moving elements, the Office's assertion that "it would have been obvious to one of ordinary skill in the art to make the heat transfer element disclosed by Batchelder as a unitary structure..." (Office Action of March 28, 2006, page 3) is simply not logical. Nor, in view of the moving elements of the active spreader sheet 20 of Batchelder, would it have been "merely a matter of obvious engineering choice" to unitize the elements of Batchelder's active spreader plate.

Further, by requiring that the portion of the active spreader plate 20 through which flow channels 50 extend be formed from two or more pieces (col. 4, lines 9-19), Batchelder teaches away from a heat transfer element fabricated as a unitized structure.

For these reasons, it is respectfully submitted that, under 35 U.S.C. § 103(a), the subject matter recited in independent claim 1 is allowable over Batchelder.

Batchelder in View of Tseng

Claim 5 stands rejected under 35 U.S.C. § 103(a) for reciting subject matter that is assertedly unpatentable over that the subject matter taught in Batchelder, in view of teachings from U.S. Patent 6,175,497 to Tseng (hereinafter "Tseng").

Claim 5 is allowable, among other reasons, for depending from claim 1, which is allowable.

Batchelder in View of Rostoker

Claims 7 and 8 have been rejected under 35 U.S.C. § 103(a) for being drawn to subject matter that is allegedly assertedly unpatentable over teachings from Batchelder, in view of the teachings of U.S. Patent 5,814,536 to Rostoker et al. (hereinafter "Rostoker").

Claims 7 and 8 are allowable, among other reasons, for depending from claim 1, which is allowable.

Batchelder in View of Fuller

Claim 10 is rejected under 35 U.S.C. § 103(a) for reciting subject matter which is purportedly unpatentable over that taught in Batchelder in view of teachings from U.S. Patent 5,529,379 to Fuller et al. (hereinafter “Fuller”).

Claim 10 is allowable, among other reasons, for depending from claim 1, which is allowable.

It is respectfully requested that the 35 U.S.C. § 103(a) rejections of claims 1-17 be withdrawn and that each of these claims be allowed.

Entry of Amendment

Entry of the proposed amendment to independent claim 1 is respectfully solicited. It is respectfully submitted that the proposed amendment to independent claim 1 does not introduce new matter into the above-referenced application and would not necessitate an additional search.

In the event that the proposed amendment is not entered, entry thereof upon the filing of a Notice of Appeal in the above-referenced application is respectfully requested.

CONCLUSION

It is respectfully submitted that each of claims 1-17 is allowable. An early notice of the allowability of each of these claims is respectfully solicited, as is an indication that the above-referenced application has been passed for issuance. If any issues preventing allowance of the above-referenced application remain which might be resolved by way of a telephone conference, the Office is kindly invited to contact the undersigned attorney.

Respectfully submitted,



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